

THE CERES S'COOL PROJECT

STUDENTS' CLOUD OBSERVATIONS ON-LINE

Lin Chambers
NASA LaRC, Hampton, VA

**Tina Rogerson (ASDC), Camelia Deller,
Joyce Fischer, and Susan Moore**
SSAI

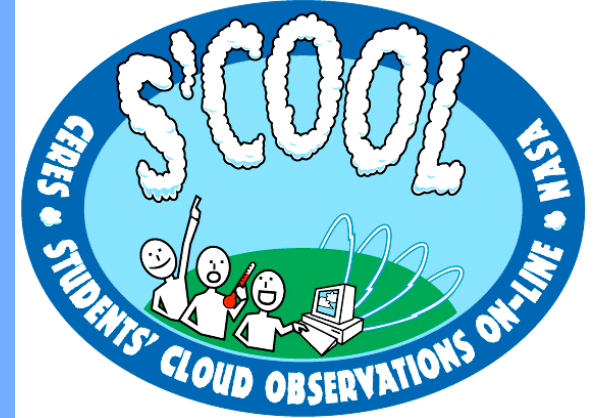


[NASA Web Site Privacy Statement]
Last Updated: Fri Mar 21 2003 13:42:08
Web Curator: P. Key Costello (p.k.costello@larc.nasa.gov)
Responsible NASA Official: Lin H. Chambers, Director, Students' Cloud Observations On-Line Project

**CERES Science Team Meeting
Newport News, VA
April 2007**

What is S'COOL?

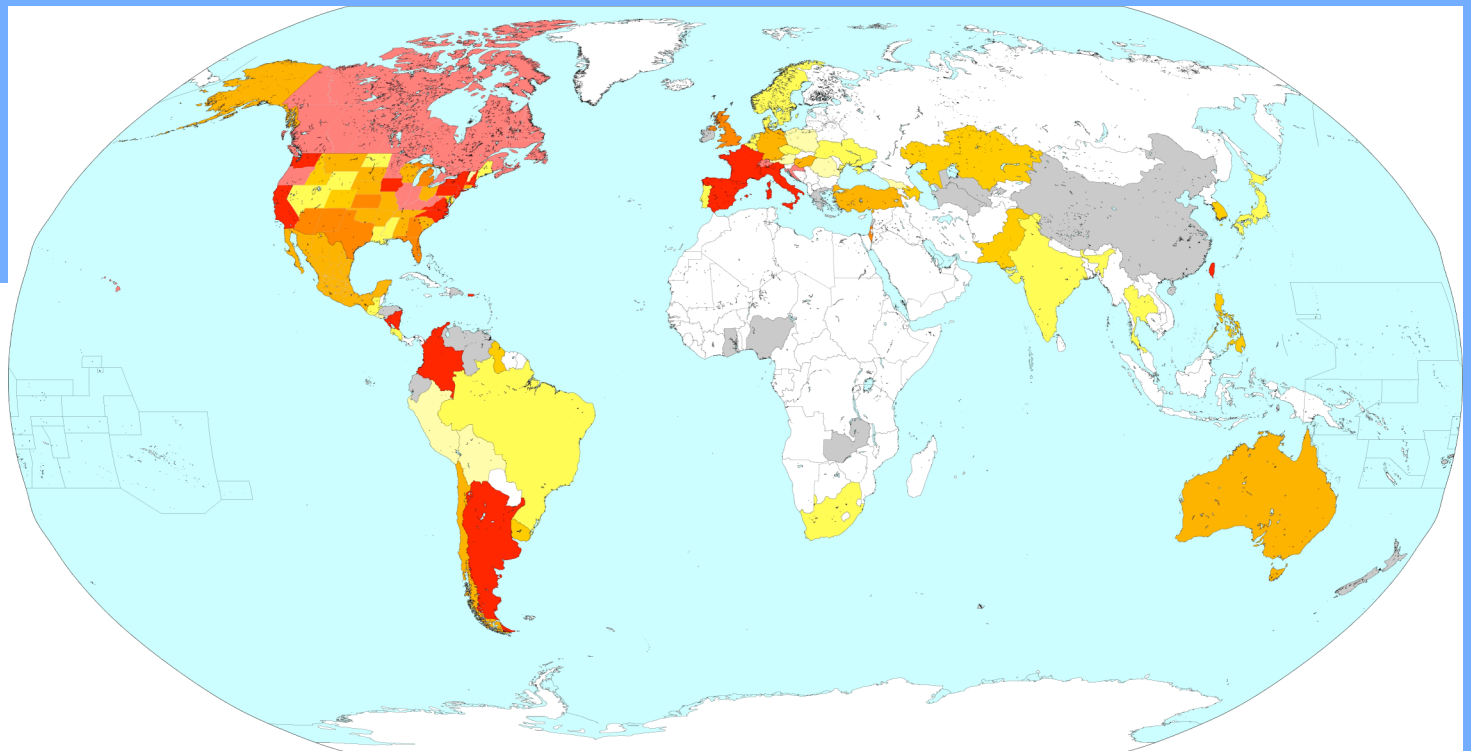
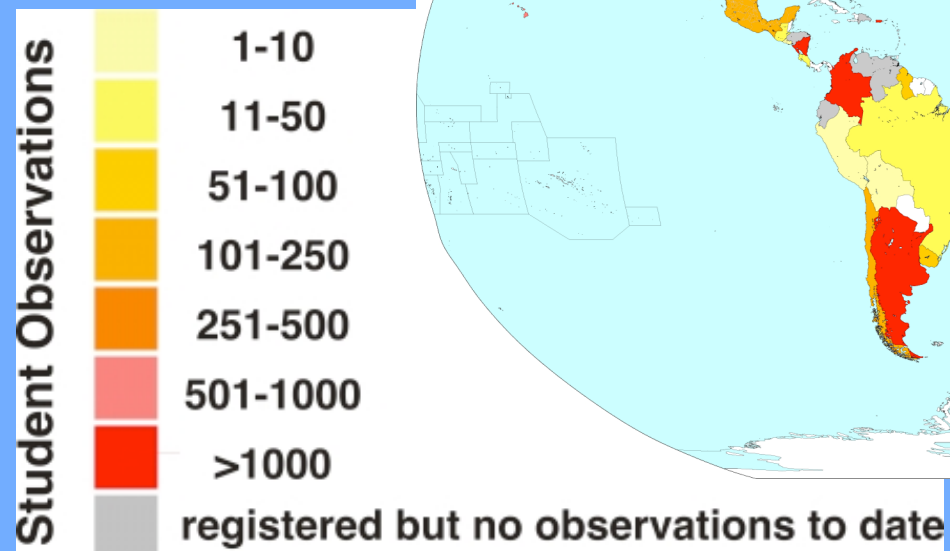
- Education and Public Outreach arm of CERES
- Backbone of Terra/Aqua formal education effort
- A simple way to involve K-12 students in authentic science
- A source of validation data for the CERES cloud retrievals



<http://scool.larc.nasa.gov>

S'COOL Project

- > 60,500 observations from 50 countries and all 50 states
- 41 % from outside the US (80% US participants)
- > 2,250 registered participants from 70 countries



Map as of April 2007

New Person

- Camelia Deller has joined us on a part-time basis
- Spanish speaker (from Barcelona)
- Handles contacts and inquiries from the Spanish-speaking world
- 20-25% of new registrations are from Spanish speakers since October
- 25% of observations since October are from Spanish speakers

Impact Measures

- Lots of requests for S'COOL materials since Oct. 2006 (a noticeable increase in the rate)

States "Top Five"

▪PA	21%
▪VA ↓	9%
▪PR	6%
▪NH	5%
▪CA	5%

*Small
Changes*

Countries "Top Five"

▪US	59%	
▪Colombia	8%	
▪France	7%	↓
▪Argentina	6%	
▪Taiwan	4%	↑

*Still
No Change*

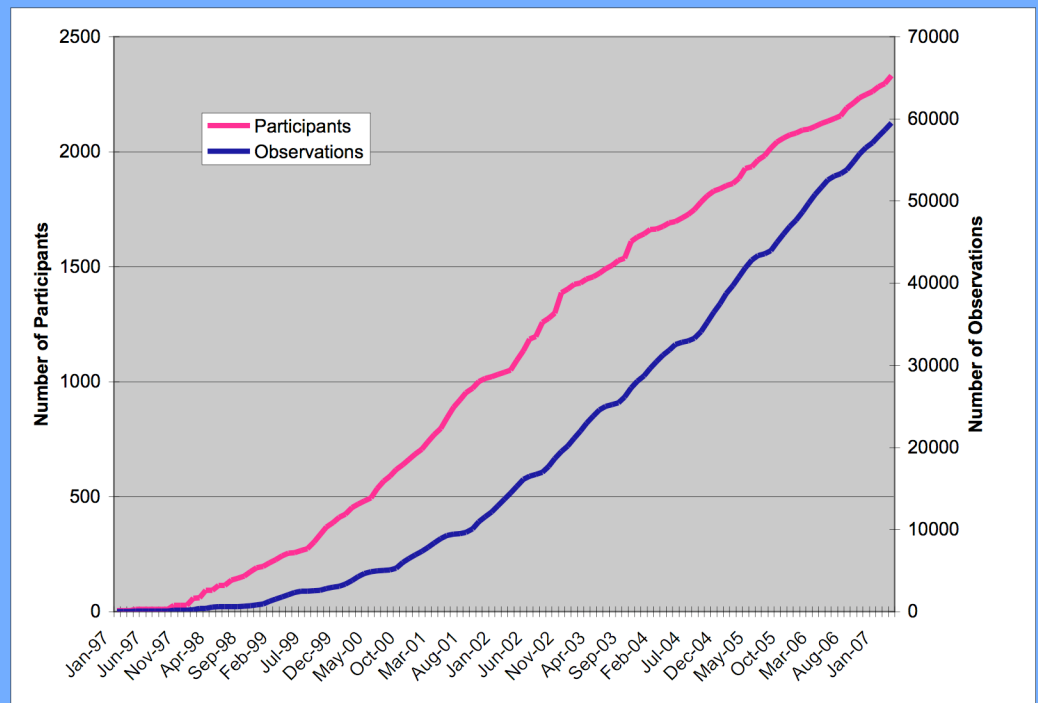
States "Bottom Five"

▪Virgin Islands	9
▪Vermont	7
▪Guam	6
▪Delaware	3
▪Northern Marianas	0

Impact Measures (cont'd)



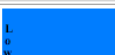

Database of observations - as of Oct. 2006

- > 25,000 satellite correspondences
 - For 42% of ground observations ↑
- 2,254 registered participants
 - 39% submitted data
- 70 countries
 - data from 50 countries (71%)



S'COOL Data

Latitude	Longitude	City	State	Country
42.82	-72.03	Jaffrey	NH	USA

Ground Observation - 63085				
Date: 2007-04-11		Local Time: 13:56:00		Universal Time: 17:56:00
Opacity	Cloud Cover	Type	Visualization	
Transparent	Clear (0% to 5%)	Cirrus		
				
				
				
Persistent Contrails: 00		Short-Lived Contrails: 00		
Surface Observations:		Snow/Ice: Yes Standing Water: No Muddy: No Dry Ground: Yes Leaves on Trees: No		
Temperature: 9.00 C Barometric Pressure: 985.30 hPa Relative Humidity: 34.00				
Comments: About 50/50 snow and bare ground				

1 degree

Cloud Cover

Partly Cloudy (5% to 50%)	7.84
------------------------------	------

Partly Cloudy (5% to 50%)	39.48
------------------------------	-------

Partly Cloudy (5% to 50%)	23.66
------------------------------	-------

subset

Cloud Cover

Clear (0% to 5%) 0.43

Partly Cloudy (5% to 50%) 7.82

Partly Cloudy (5% to 50%) 6.89

Old Match: /
Clouds processing

New Match: -
subset from SSF

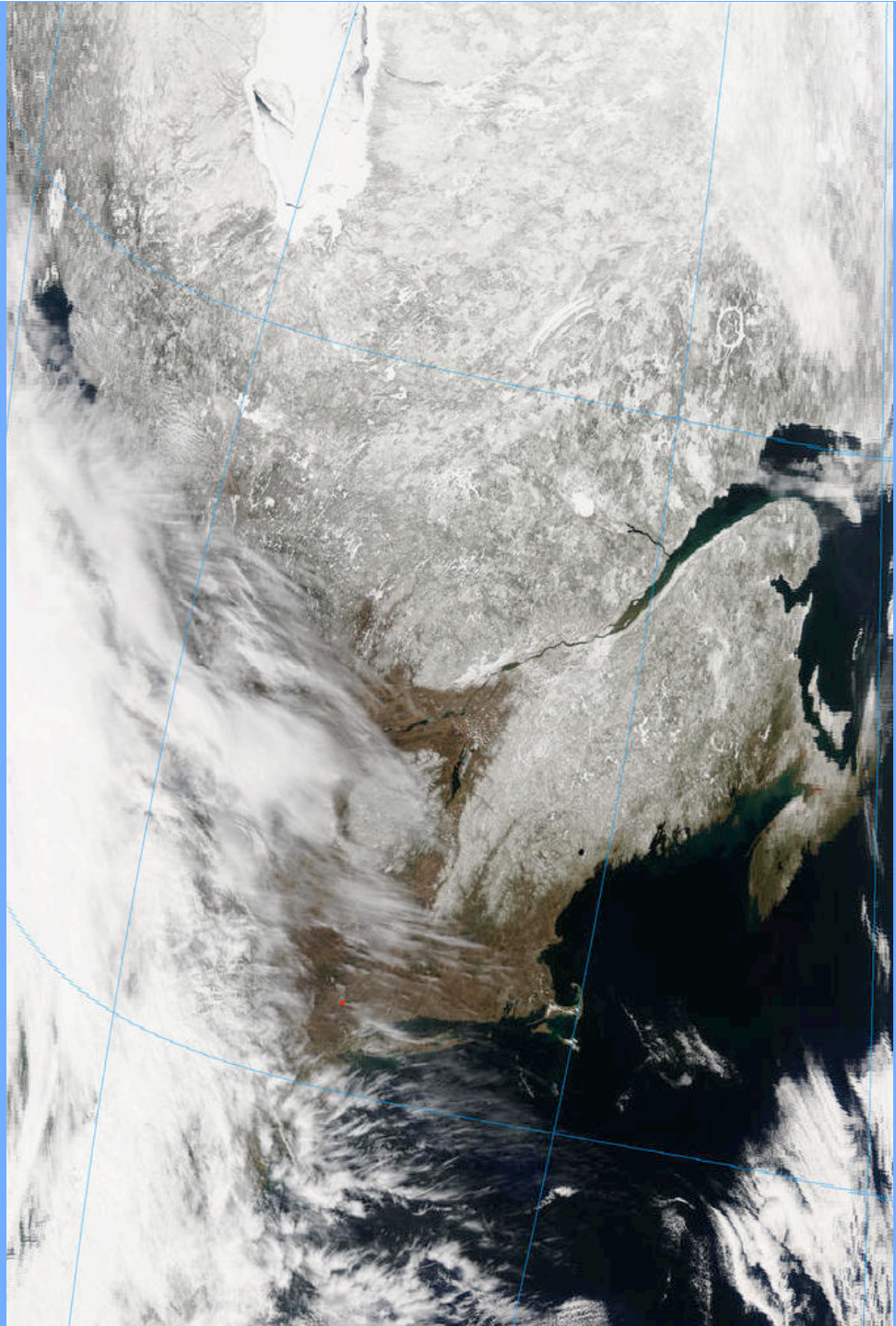
					0.00	0.55	(5 % to 50 %) 6.89	274.38
								
Persistent Contrails: 00		Short-Lived Contrails: 00			<div>View Corresponding MODIS Satellite Image</div> 			
Surface Observations:		Snow/Ice: Yes Standing Water: No Muddy: No Dry Ground: Yes Leaves on Trees: No						
Temperature: 9.00 C Barometric Pressure: 985.30 hPa Relative Humidity: 34.00								
Comments: About 50/50 snow and bare ground								
								

S'COOL Data

Issue of interest:
Snow-covered ground

Many intriguing reports
recently from:



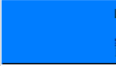









- Alaska
- New Hampshire
- New York



S'COOL Data (Cont'd)

- 479 observations have both Terra and Aqua satellite match
- Under the current auto-email system, these are being shared immediately with the CERES clouds group.
- Also can be explored on-line:
http://scool.larc.nasa.gov/en_query_double_matches.html

Latitude	Longitude	City	State	Country
59.97	-154.85	Nondalton	AK	USA

Ground Observation: 62924				Aqua: 1165318				Terra: 1165809					
Date: 2007-04-05		Local Time: 13:57	Universal Time: 21:57	Date: 2007-04-05		Universal Time: 21:57:00		Date: 2007-04-05		Universal Time: 21:44:00			
Opacity	Cloud Cover	Type	Visualization		Altitude	Opacity	Cloud Cover	Phase Temp (C)		Altitude	Opacity	Cloud Cover	Phase Temp (C)
					9.26	Transparent 2.41	(5% to 50%) 49.80	ice 219.54		9.04	Translucent 4.16	(0% to 5%) 3.00	ice 221.07
					7.20	Opaque 23.36	(50% to 95%) 50.20	ice 234.84		6.75	Opaque 23.28	(95% to 100%) 96.55	ice 237.55
Opaque	(95% to 100%)	Stratocumulus								2.34	Opaque 22.73	(0% to 5%) 0.45	ice 258.50
													
Persistent Contrails: 00		Short-Lived Contrails: 00											
Surface Observations:		Snow/Ice: Yes Standing Water: No Muddy: No Dry Ground: Yes Leaves on Trees: No											
Temperature: 6.67 C Barometric Pressure: 985.66 hPa Relative Humidity: 57.00 %													
Comments: No comments provided by participant.													

(Aqua and Terra do not always match)

(Aqua and Terra do not always match)

S'COOL Interaction (1)

- Have sent 3,533 FLASHFlux auto-emails since we began this in mid-September 2006
- 1,730 observations have been classified by participants
- 495 comments provided back to S'COOL by email
- Responded to a large fraction
- Developing Comparison FAQ with common themes

Please help to classify how your ground observation compares to the Aqua satellite's observation. Select one of the below categories to describe how well the two match.			
Class Number	Name	Description	Developed By
1	<input type="radio"/> Perfect match with Aqua	Cloud cover and opacity match perfectly at all 3 levels	S'COOL Team
2	<input type="radio"/> Cloud cover match	Cloud cover matches at all three levels	S'COOL Team
3	<input type="radio"/> Overcast or mostly cloudy low	Overcast or mostly cloudy low cloud corresponds to satellite; other levels not observable from the ground	S'COOL Team
4	<input type="radio"/> Overcast high or mid	Overcast high or mid-level cloud; other levels not observable from satellite	S'COOL Team
5	<input type="radio"/> Fuzzy match	Cloud cover differs by at most one category at all levels	S'COOL Team
6	<input type="radio"/> Sparse cloud	Ground or satellite reports 0-5% cloud only at a single level; the other sees nothing	S'COOL Team
99	<input type="radio"/> None of the above	I cannot put this correspondence in any of the above categories.	S'COOL Team

<p>Please comment on the quality of the match: Might there be anything about the ground observations or the Aqua satellite data that would explain any disagreement between the two?</p>	<p>The only thing we can think of that may account for the discrepancy is there were more clouds near the horizon (to the south and southeast) which may have been low to mid- level. Overhead was pretty clear. Based on information in the introductory packet from S'COOL we didn't report the distant clouds thinking they were out of range of the satellite viewing area. Maybe they were closer than we thought.</p>
---	---

S'COOL Interaction (2)

- Email on new subset/footprint matching starts THIS WEEK
- Includes link to BOTH matching methods, when available

Date: Thu, 19 Apr 2007 12:46:46 -0400

Hello Jaffrey Grade School students,

ATTENTION : This is the **new** satellite matching process we mentioned in our [March](#) enote that compares your ground observation to a smaller piece of the satellite data. We call this smaller piece of the satellite data a "footprint" where your school is in the center of the satellite "footprint".

The link(s) below will display one or more of your S'COOL observation reports that has been matched using this new method. We are interested in your comments on how this satellite information compares to your ground observations. In particular we would like to know whether the agreement is better or worse than the regular method that we have been using.

[Footprint April 11, 2007](#)

[Regular April 11, 2007](#)

When you have time, please look at the information for these dates in comparison to your report form and to the standard satellite match if you received one. Do you have any comments on this comparison? Do you remember anything about the conditions on this day which would help to explain the comparison? Do you notice anything interesting or odd about the two different satellite methods? You may wish to refer to the [Frequently Asked Questions](#) page.

Thank you for your S'COOL cloud observation report! As always, we welcome your comments and feedback.

S'COOL Presentations Since October 2006

- **Presentations at local science teachers conference**
- **Presentations at regional and national Science Teachers Association Conference (NSTA)**
- **Teacher Workshop at Virginia Air and Space Center**
- **Presentation at NASA HQ**

S'COOL + SPHERE

- Will have 2-3 college students for 8 weeks this summer
- Hoping to continue analysis of ground vs satellite data
- Suggestions welcome!



S'COOL in the Field

- Teacher Ambassador presentations:
 - Massachusetts Environmental Education Society (T. Kisiel)
 - NSTA Baltimore (F. Brezna and K. Waljeski-Moses)
 - State Weather Workshop, New Hampshire (N. Munsey)
 - SEEC Conference in Houston Texas (L. Werhun)
 - Science and Math teachers convention - Saskatoon, Canada (C. Dauvin)
 - Minnesota Science Teachers Association and teacher training through MnSTEP. (J. Minerich)



S'COOL Connections


































- **Contacted by NOAA/NWS about creating a joint cloud chart**
- **NOAA would print and distribute > 100,000 copies**

[illegible]

National Aeronautics and Space Administration

NOAA/NWS AND NASA'S SKY WATCHER CHART

 <p>H1 Cirrus In the form of filaments, strands, or hooks</p>	 <p>H2 Cirrus Dense, in patches or sheaves, not increasing, or with tufts</p>	 <p>H3 Cirrus Often part of cloud patterns of a cumulonimbus</p>	 <p>H4 Cirrus In bands or filaments, increasing, becoming denser</p>	 <p>H5 Cirrostratus Cirrus bands, increasing, will below 45° elevation</p>	 <p>H6 Cirrostratus Cirrus bands, increasing, well above 45° elevation</p>	 <p>H7 Cirrostratus Translucent, completely covering the sky</p>	 <p>H8 Cirrostratus Not increasing, not covering the whole sky</p>	 <p>H9 Cirrostratus Dense or with some cirrus or cumulus</p>
 <p>A1 Altostratus Most of sky obscured, sun or moon may be dimly visible</p>	 <p>A2 Altostratus Becoming more dense and lower</p>	 <p>A3 Altostratus Semi-transparent, low level cloud elements change slowly</p>	 <p>A4 Altostratus Lens-shaped, or continually changing shape and size</p>	 <p>A5 Altostratus One or two bands of layers, expanding, thickening</p>	 <p>A6 Altostratus From the spreading of cumulus or cumulonimbus</p>	 <p>A7 Altostratus One or more deeper layers, of altilutis or nimbostratus</p>	 <p>A8 Altostratus With cumulus-like tufts or funnels</p>	 <p>A9 Altostratus Clearly sky, locally at several layers, maybe in dense cirrus</p>
 <p>L1 Cumulus With well defined bases</p>	 <p>L2 Cumulus Moderately increasing vertical extent, or towering cumulus</p>	 <p>L3 Cumulonimbus Tops and filices, indicate not completely sharp, no anvil</p>	 <p>L4 Strato-cumulus From the spreading and flattening of cumulus</p>	 <p>L5 Strato-cumulus Not from the spreading and flattening of cumulus</p>	 <p>L6 Stratus In a well-defined layer and/or ragged clouds</p>	 <p>L7 Stratus Fractus and/or Cumulus Fractus Of low altitude</p>	 <p>L8 Cumulus & Strato-cumulus Not spreading, bases at different levels</p>	 <p>L9 Cumulonimbus with filices but, often with an anvil</p>
 <p>Nimbostratus Dropping rain or sleet, sun obscured, clouds lower</p>	 <p>Tornado Formed by rotation of air and clouds, within thunderstorm</p>	 <p>Rapid Cloud Fraging from cumulus, possible forecast formation</p>	 <p>Low-level fog Leading edge of fog from frontal system</p>	 <p>Wedge cloud Formed by strong horizontal winds over current waves</p>				

National Aeronautics and Space Administration
<http://www.nasa.gov>

National Oceanic and Atmospheric Administration
<http://www.noaa.gov>
<http://www.weather.gov>

National Aeronautics and Space Administration
<http://www.nasa.gov>
 National Oceanic and Atmospheric Administration
<http://www.noaa.gov>
 National Weather Service
<http://www.weather.gov>

S'COOL Needs YOU!

- **Participants in every state and 70 countries**
 - Offer to serve as a **resource** to a **local teacher**
 - Arrange a **S'COOL** visit when traveling
 - Provide **S'COOL** info to teachers you know
- **Presentation materials available**, with script suggestions
- **Help with translation of materials**
- **Serve as resource for scientific content questions sent in by participants**